

INTERNATIONAL  
STANDARD

**ISO**  
**5945**

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**Rubber — Determination of polyisoprene  
content**

*Caoutchouc — Détermination de la teneur en polyisoprène*



Reference number  
ISO 5945 : 1989 (E)

**ISO 5945 : 1989 (E)****Foreword**

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5945 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition cancels and replaces the first edition (ISO 5945 : 1982), of which it constitutes a minor revision.

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International Organization for Standardization  
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# Rubber — Determination of polyisoprene content

## 1 Scope

**1.1** This International Standard specifies a method for the determination of polyisoprene occurring as natural isoprene rubber (NR)<sup>1)</sup>, synthetic isoprene rubber (IR), balata and gutta percha, in the total solids from NR or IR latices, in solid raw rubbers, or in cured or uncured compounds.

The method is applicable to these isoprene rubbers alone or in blends. It cannot be used for hard rubber (ebonite) without modification.

**1.2** Compounding ingredients, such as carbon black, mineral oil and sulfur, in soft rubbers do not interfere (see table 1) (but see also 8.2). If vinyl acetate polymers are present, the method should not be used.

**1.3** The method is applicable to blends of the rubbers mentioned in 1.1 with SBR, BR and NBR.

If halogenated rubbers are present, a slightly modified procedure, described in 7.7.3, is used. Some interference may be expected, because these rubbers react with chromic acid in a manner similar to polyisoprene. If these interfering rubbers are the major part of the blend, they may impede the reaction of the polyisoprene with the chromic acid. The digestion shall then be checked for completeness on known mixtures of these interfering rubbers.

Milling of the test portion as finely as possible is advisable.

**1.4** The method may be used for the determination of polyisoprene in reclaimed rubbers, but it has been found to give consistently lower values than the previously accepted estimates for the polyisoprene content.

**1.5** If rubbers other than those mentioned in 1.3 are present (CSM, EPDM, IIR, CIIR and BIIR), the digestion time shall be modified. The estimates shall be corrected by comparison with results from similar rubber blends. If these interfering rubbers are present in the blend, they may impede the reaction of the polyisoprene with the chromic acid and the method is not applicable. Greatest deviations are found if polysulfide rubbers are present as part of the mixture. (See table 2.)

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 123 : 1985, *Rubber latex — Sampling*.

ISO 124 : 1985, *Rubber latices — Determination of total solids content*.

ISO 1407 : 1976, *Rubber — Determination of solvent extract*.

ISO 1795 : 1974, *Raw rubber in bales — Sampling*.

## 3 Principle

Quantitative oxidation of the polyisoprene present in a test portion with a hot digestion mixture of sulfuric and chromic acids; distillation of the acetic acid formed, aeration of the distillate to remove carbon dioxide and titration of the acetic acid with sodium hydroxide solution.

The calculation is based on the observation that a 75 % yield of acetic acid is always obtained in oxidation of the isoprene unit under the specified test conditions.

## 4 Reagents

**All recognized health and safety precautions shall be exercised when performing this method of analysis.**

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

**4.1 Extraction solvents:** acetone, chloroform (used in a closed extraction system) or dichloromethane.

1) For the meanings of the abbreviations, see ISO 1629 : 1987, *Rubbers and latices — Nomenclature*.